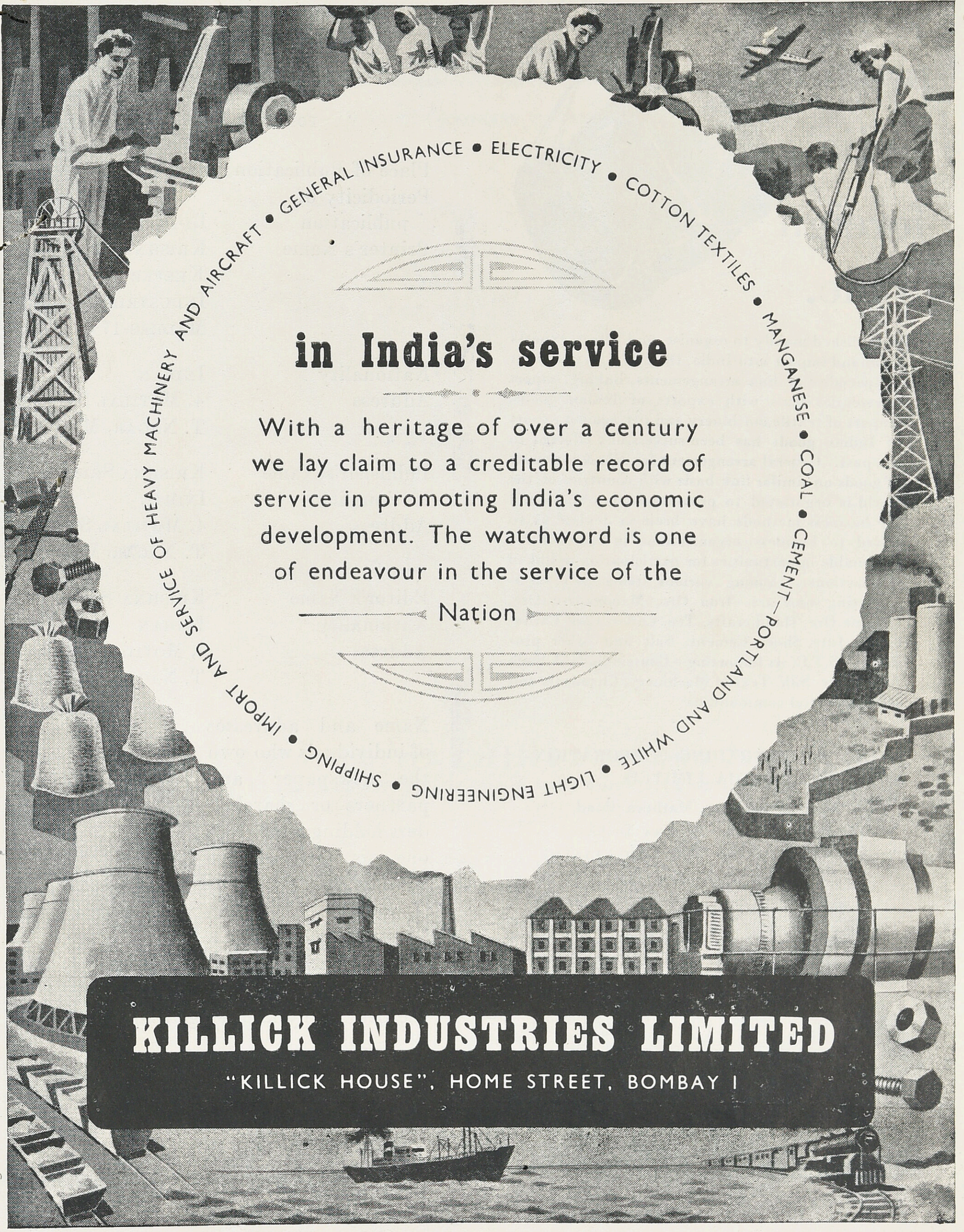
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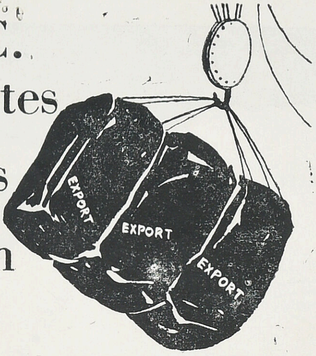

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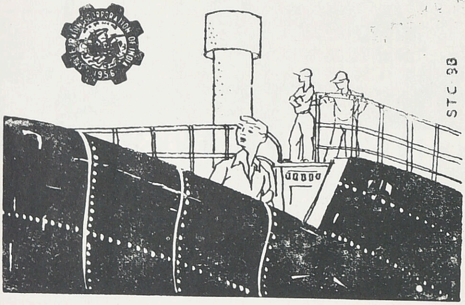

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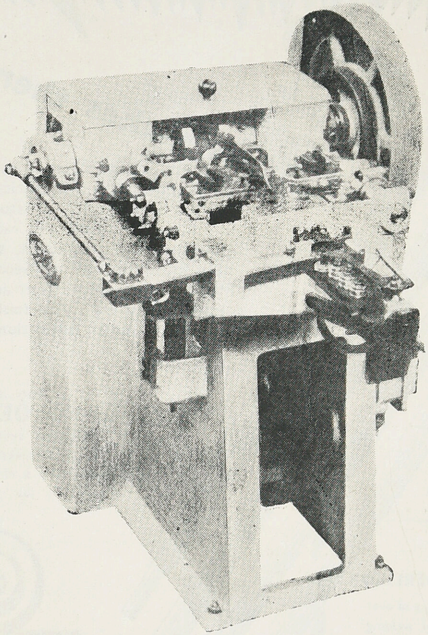

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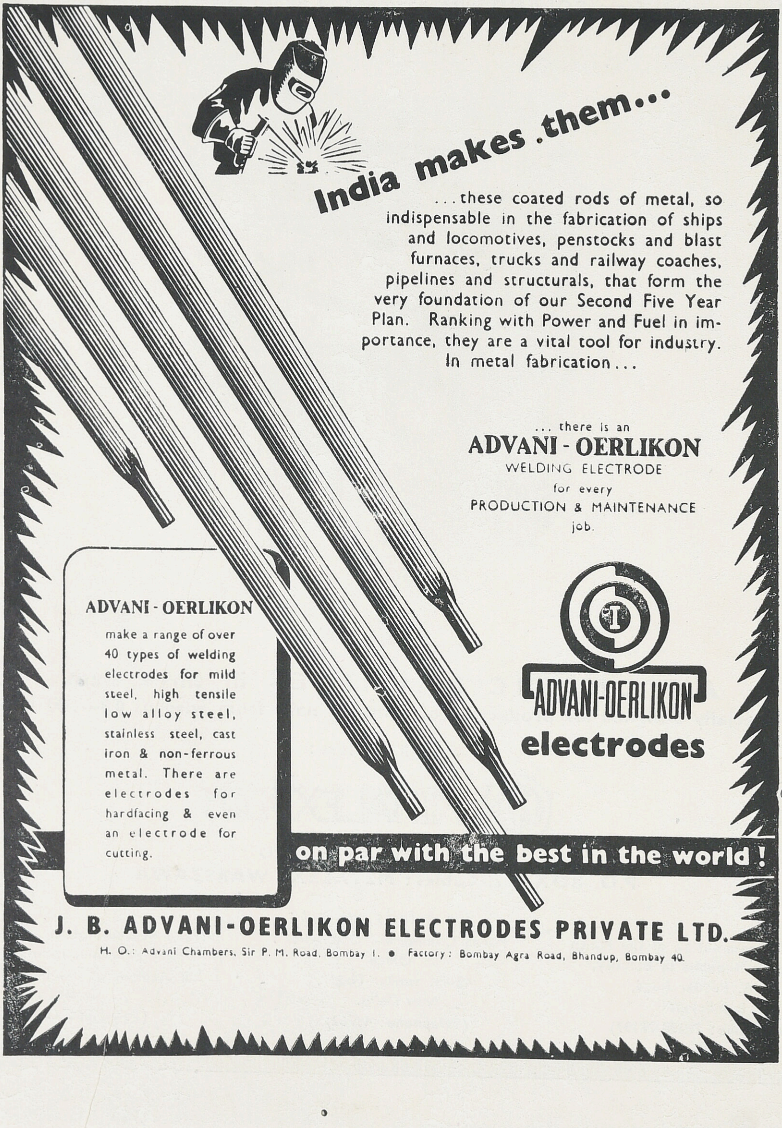
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MAJOR INDUSTRIES NUMBER

CONTENTS

		PAGE
Editorial		6
Industrial Development	— Manubhai Shah	9
Big Third Plan		17
Electronic Computers	— Stephan Schattman	22
Perambur's 1,000th Coach	— S. R. Tikekar	25
Aluminium		29
Soviet Oil Workers help India	— N. Kalinin	30
Indian Textile Industry	— K. Parthasarathy	32
Bombay's Cable Factory		37
Minerals		39

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OUR NEXT ISSUE

1960 ANNUAL NUMBER

100 Pages - Rs. 2/- a copy

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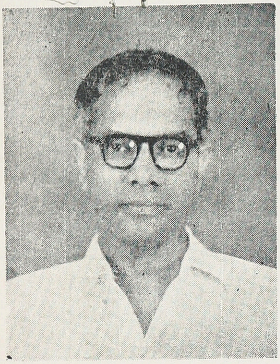

MAJOR INDUSTRIES

If India fails, Asia fails: so said Mahatmaji. India must not fail. The great industrial revolution that is taking place in India, silent and dynamic, will usher in a golden age of prosperity. In this most gigantic experiment we are making, unparallelled in the economic history of the World, we are receiving technical and financial help for the implementation of our various development projects. Main assistance has come from the U.S.A., the U.S.S.R., the U.K., Canada, Australia, New Zealand, West Germany, Japan, France, Norway, Czechoslovakia and Rumania. And I.B.R.D. has generously provided us loans. Up to the end of November, 1959 the total sum earmarked for our various schemes amount to Rs. 1,760 crores.

Despite the tight foreign exchange situation, the level of industrial production in 1959 rose substantially over the previous year. The index of industrial production for the first ten months of 1959 recorded an increase of 10.4 points—from 138.9 to 149.3—over the previous year's figures, as compared with an increase of less than 2 points in 1958 over 1957.

There was substantial increase in production of sugar machinery, diesel engines, machine tools, automobiles, sulphuric acid, iron and steel, aluminium, super-phosphate, soda ash, cement and paper and paper board. We are currently producing 1,32,000 tons of steel structures, one lakh tons of steel pipes and tubes, 30,000 tons of steel castings and 12,000 wagons and under-frames. Of finished machinery and equipment, production in 1959 included sugar mill machinery worth Rs. 2.5 crores and machine tools worth Rs. 4 crores. We are also producing 30,000 diesel engines, two million ball bearings, 34,000 automobiles, 175 diesel road-rollers, 6,00,00. H.P. of electric motors, one million KVA of power transformers and 288 million running feet of welding electrodes.

With increasing supplies of steel, the output of engineering industries would

rapidly rise. We are also producing 16,000 tons of aluminium, 7,500 tons of copper, 60,000 tons of ferro-manganese and some quantities of lead, zinc and antimony. The capacity for producing caustic soda, soda ash, sulphuric acid, cement and calcium carbide has increased substantially and many new lines of production have been established including hydrogen peroxide, industrial and mining explosives, ammonium nitrate, acetone etc.

Good progress has been made in the Heavy Electrical Project at Bhopal, being set up with British collaboration. The construction of the first phase is nearing completion. In the meantime, Government have decided to accelerate the remaining phase of the project and also to provide for its substantial expansion. The Bhopal project will supply not only heavy transformers and switch gears, but also turbines and generators, traction motors and many other lines of heavy electrical equipment.

The Heavy Machinery Project at Ranchi, which is being set up with Soviet collaboration and will have integrated with it a Heavy Foundry and Forge, being set up with Czechoslovak collaboration will provide the machinery required for steel plants. It has been decided to expand the capacity of this project from making 45,000 tons of machinery to 80,000 tons of machinery a year. Once this plant has gone into full production, it will be possible to build most of the non-electrical machinery items required for a steel plant of one-million ton capacity.

Apart from these two big projects, a number of other machine building projects including a Mining Machinery Project, a Heavy Machine Tools Project, a Heavy Structural Project, a Heavy Plate and Vessels Works and two more Heavy Electrical Projects have been approved by Government, in consultation with the Planning Commission for immediate implementation, so that they may go into production as early in the Third Five Year Plan as possible. Among other public sector projects in hand which will go into production in the Third Five Year Plan period, there are a number of Fertilizer Plants in different parts of the country, a number of Drugs and Pharmaceutical Projects, an Intermediates Plant to provide the basic raw material for organic chemical industries as well as a project to produce Cinematographic and X-Ray films.

The increased production of steel in public sector plants will encourage the expansion of engineering industries in the private sector. The indigenous availability of basic chemicals and intermediates will make the production of drugs, dyestuffs and plastics less dependent on the availability of foreign

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exchange for the import of raw materials. The increase in machine building capacity will enable industries in India to expand their capacity without having to depend upon imports and the consequent expenditure of foreign currencies. Additional capacity for making transformers to the extent of 2.32,000 KVA, structurals to the extent of 20,000 tons a year, steel castings to the extent of 12,000 tons a year and high quality grey iron castings for automobile and other industries will shortly come into being. The sanctioned schemes for the manufacture of aluminium now amount to over 75,000 tons a year.

The targetted expenditure of Rs. 1,094 crores originally proposed for industry both in the public and private sectors is likely to reach Rs. 1,475 crores by the end of the Second Plan.

In the Third Plan, the total investments for Industries, Minerals and Transport will reach the enviable figure of Rs. 4,000 crores—actually double the amount we spent for the whole of the First Plan.

Basic industries, like steel, fuel and power with an accent on machine-building capacity will be established all over the country that the requirements of further industrialization can be met within a decade mainly from our nation's own resources.

India's economic power will be then at its meridian. ★

Krishna Srinivas

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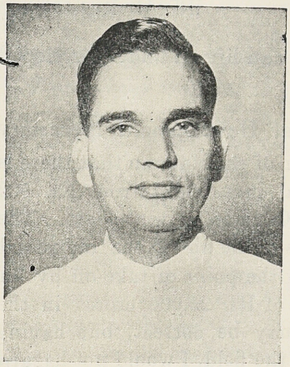

Our most versatile Minister knows what to say and he alone knows how to say it. This masterly survey of Major Industries is illuminating and enthralling.

INDUSTRIAL DEVELOPMENT

MANUBHAI SHAH
Union Minister of Industry

The production of industrial sector has gone up in spite of the hardships through which both the private and public sector industries had to pass in the last two or three years, due to severe restrictions on foreign exchange. On the export front also, there has been a remarkable rise, compared to what we had experienced last year when there was a general world recession in foreign trade. However, what I would like to urge is that this result has not been due to any effort in a single year, but to a sustained industrial and economic policy since the national Government came into power.

In the First Five-Year Plan, the total investment *in the public sector* on large-scale industries and minerals was about Rs. 60 crores; in the village and small-scale industries it was Rs. 44 crores and in the matter of electric power it was Rs. 260 crores (since the Plans began, investment in power generation became more or less a State function and it is most intimately connected with industries as most of it is consumed by the industries). Thus the total investment under these three heads, which are directly connected to more or less all factory industries, was about Rs. 364 crores in the public sector in the first Plan. In the private sector, in the First Five-Year Plan, the total investment under these three heads was large-scale industries and minerals Rs. 340 crores village and small-scale industries Rs. 88 crores and power about Rs. 30 crores, thus making a total of Rs. 458 crores.

This makes the total in the First Five-Year Plan Rs. 822 crores in the industrial sector.

In the Second Five-Year Plan, due to the deliberate policy of giving greater and greater emphasis on industrialisalion, the total investment of Rs. 822 crores rose to Rs. 2,755 crores. Of this, Rs. 1,483 crores was in public sector and Rs. 1,272 crores in private sector. In the public sector, large scale industries and minerals accounted for Rs. 822 crores, village and small-scale industries Rs. 180 crores and power Rs. 481 crores. And in the private sector, Rs. 850 crores was on large scale industries and minerals, Rs. 360 crores on village and small scale industries and Rs. 62 crores of investment on private power houses.

Industrial Investment in Third Plan

Thus, there was a big leap from the first to the Second Plan. In the Third Plan, we are going to have a still greater emphasis on more massive industrialisation; and for large-scale industries and minerals, the tentative outlay will be about Rs. 1,300 crores in the public sector; village and small-scale industries will be between Rs. 250 crores to 300 crores, including loans and various assistance. It is hoped, some means and methods will be found to raise this investment on village and small-scale industries to over Rs. 300 crores. Outlay on power will be about Rs. 900 crores. This will make the estimated total investment of Rs. 2,500 crores in the public sector on industries including power.

The Third Plan's gross estimates for the private sector's large-scale industries and minerals will be Rs. 1,250 crores, village and small-scale industries Rs. 600 crores and power Rs. 50 crores, giving a total estimated investment on industries of Rs. 1,900 crores. Thus the aggregate industrial investment will rise to Rs. 4,400 crores in the Third Plan.

It is clear that such a policy as we have been following, of rapid agricultural development and massive industrialisation is the only policy which can lift an under-developed country likeours.

Massive Industrial Development Necessary

It is a matter of satisfaction that there is a rise in industrial investment from Rs. 822 crores to Rs. 4,400 crores in ten years. The various estimates made about the industrial economy reaching the point of take-off by an extra investment of Rs. 25,000 crores in the next ten years may be correct, but having seen the work on the field, I would not hazard any guesses, because take-off, as it is understood in economics, is more or less total self-reliance, without any foreign long-term credit assistance for sustained and accelerated growth of national economy. But apart from the growth or the take-off stage of economy, attention should be drawn and riveted to the very great need for still further and more massive industrial development, if the country is to cross the hump of underdevelopment, to provide adequate employment opportunities, so that the selfsustaining growth of economy can be reached. We will have to strive far more intensively with greater vigour and removing all the laxity which our national economy today experiences in a large measure. No country in the world with gross domestic product of less than 25 per cent from industrial origin, as we are having today from the industrial sector, could think of a self-sustained growth of its economy or of providing any large measure of employment opportunities. For that work which lies ahead of us for the next ten or 15 years, all the people of this country will have to work in full harmony.

For this growth of economy which has brought the industrial production index to 151 in 1959 from what it was last year, namely 139.7 a growth of 11.3 points and in terms of percentage, about 8 per cent—the private industrial sector must be congratulated for the very impressive record of work that they

have put in, in the last year. Even though many of us believe that the role of the public sector in this country in the coming years will be of a very major nature, one cannot fail to appreciate the great role that the private industry has played and what it has contributed to the growth that we witnessed during the year 1959.

It is our good fortune that the Steel Ministry's tentative target of ten million tons of ingot steel and 95 million tons of coal are more or less being accepted. We know from experience that the real trouble had been the acute shortage of basic raw materials like stell, tin plates, copper, wool tops, rayon yarn, various chemicals, components, alloys and steel sheets. The day should not come again in India when due to any defect or any slip in planning, we again face the same situation of acute shortage of tin plates, steel sheets, black sheets, galvanised steel sheets, mild steel plates, lighter sections, merchant steels and various types of alloys, tool steels, the scarcity of which we have experienced in the last three years in an acute manner. I am quite sure that with the farsightedness that our planners possess, we will be out of the woods as far as steel is concerned.

Out of an investment of Rs. 1300 crores, about Rs. 330 crores or more will be required for the steel expansion and perhaps with the starting of the Bokaro steel plant, we will be able to reach a target of 10 million tons over and above the expansion that may take place in the private sector. The minerals and oil will claim about Rs. 390 crores leaving about Rs. 550 to 600 crores for the projects of the Ministry of Commerce and Industry.

Heavy Machine Building Plant

Out of these, the most important project that we are undertaking is the heavy machine building plant at Ranchi. This is going to produce, according to the revised target, 80,000 tons every year, of industrial machinery required by the steel plants, the cement plants, the machine tool plants and various other heavy industries when the project will be completed. The investment will run to about Rs. 80 to 100 crores and by 1964 we hope for at least 25 to 30 per cent of the heavy machinery requirements of the first Indian steel plant at Bokaro. In the first year or the second year of the Fourth Plan, we shall accelerate and complete this project with the manufacture of the rolling mills and reduction mills and all other heavy materials, so as to provide to the nation machinery and equipment for one complete steel plant which could well produce 1 million tons of ingot steel every year from the year 1966-67.

Along with this Ranchi project, there will be two national institutes established there. One institute will train machine designers from the Indian engineers of experience who shall be, in future, able to design industrial machinery which would be produced in the country. The other institute will be for the foundry just on the lines of the Nottingham Institute in Britain where the foundry men of high experience will be trained from year to year.

Heavy Electrical Projects

Another important project is the heavy electrical project at Bhopal. We have now programmed for three electrical projects. One is at Bhopal and of the other two, one will be with the Russian collaboration and the other with the Czechoslovak collaboration. The actual sites for the other two electrical projects have not been decided as yet. The principle of dispersing heavy industries as much as possible in every part of the country will be borne in mind, because already claims have started coming that this project should go to a particular State or the other.

As regards the production programme, the Bhopal project is now almost programmed to produce Rs. 6¼ crores per year up to Rs. 50 crores per year within the next ten years. As a matter of fact, it might be possible to accelerate the production and reach the target within 7—8 years. This very year, from June or July, the production will start giving heavy transformers and in another four to five years, the first hydro-turbo alternator will emerge out of the Bhopal plant and by the end of the Third Plan, we hope to give the country Rs. 25 crores worth of hydro turbines, transformers, switch gears, control gears and all the other heavy electrical equipment that can flow out of such a project.

We are very proud to see that the technicians and the trainees—about 2700—who are being trained in Bhopal received very high appreciation from the British experts who visited these works. At one time, the foreign collaborators were reluctant to agree to a programme of acceleration, but when their experts saw our youngmen, they felt confident that any work could be attempted by these Indian engineers. Therefore, new manufacture of 60 m.w. steam turbines also will be included in the programme, so that steam turbines, along with hydel turbines, would be produced in the Bhopal project.

Over and above this, the Russian and Czechoslovak aided project will also help to produce each about Rs. 30 crores of heavy electrical equipment. This comes a total of about Rs. 80 to Rs. 90 crores every year of heavy electrical equipment out of these three projects.

Even these three plants, with the capacities contemplated, would not be able to provide more than 60 to 65 per cent of the national needs and we will have to enlarge the projects and take further steps to see that we cover the entire requirements of the country in heavy electrical equipment. Therefore, I would invite the cooperation of the private sector. They may also initiate some schemes and projects for the manufacture of these turbines, transformers, switch gears, drill gears and diesel generators, so that the public and the private sectors together can make the country self-sufficient in heavy electrical equipment as early as possible.

The Durgapur coalmining project is being doubled from 30,000 to 60,000 tons to include 45,000 tons of coalmining machinery and about 15,000 tons of mineral oil, petroleum and other exploration drills, jigs, etc. Even in this 45,000 tons of coalmining machinery, we are trying to include a diversified programme, to have mining equipment for iron ores, chrome ores, bauxite and various other types of minerals. Therefore, the Durgapur mining machinery project is going to be one of our very fine projects which will give a great boost to the mineral industry.

Fertiliser projects

About fertiliser projects, a target of one million tons of nitrogen per year has already been approved for the Third Plan, of which about 800,000 tons of nitrogen will be manufactured in the public sector with the present four public sector projects at Rourkela, Neyveli, Nangal and Trombay, and three or four new projects proposed in the public sector in the Third Plan with an investment of about Rs. 125 to Rs. 130 crores. Here also, the cooperation of the private sector in the establishment of more fertiliser plants will be most welcome to the country, because fertiliser is a commodity for which there will always remain a constant and insistent demand. As a matter of fact, during the current and next Plan it would be better to license imports of fertilisers on other sectors. It is imperative that in the next three or four years, we permit import of as large a quantity of complex fertilizers as possible to meet the requirements of money crops, agricul-

ture, tea and coffee plantations etc. because every rupee invested in fertilisers will yield to the nation two or three rupees of national gross product. Such imports of fertilisers on a liberal scale, till our fertiliser plants go into production, will be most beneficial.

Manufacture of Drugs

Regarding drugs, I would like to say that, by the third year of the Third Plan, we shall be in a position to produce practically every basic life-saving drug, antibiotics, sulphadrugs, alkaloids, synthetic drugs, vitamins and all the other organic chemimal intermediates. The total value of drugs and intemediates produced in the public sector will be Rs. 44 crores per year. We are fortunate in having collaboration from the Soviet Union as well as the West German firms of Bayer, Hoeoht and others. The West German plant will be perhaps the first single unit to manufacture such complex and difficult intermediates of organic chemicals in the whole of the Asiatic continent.

Machine Tools

On the machine-tools side, the production of the Hindustan Machine Tools Ltd. is already being trebled from 600 machines to 2000 machines, and we are planning two more medium type machine-tools. It is our endeavour to see that these machinetool plants will be dispersed in as many places as possible. We are already doubling up production of Praga tools factory at Hyderabad and making it practically as big as the Hindustan Machine Tools, and it will make the precision machine-tools as well as various other items of engineering industry.

On the heavy machine-tools side, we have secured the collaboration of the Czechoslovak Government who have given us good technical know-how and credit. The heavy machine-tool project will be one of the very complicated and difficult projects, of all the heavy industries that we are contemplating. We are not quite sure of the size, but we do believe that about 15,000 to 20,000 tons of machine-tools per year of all heavy varieties will begin to be manufactured in the Czechoslovak project, as soon as it goes into production by 1964-65.

Raw Film Project

The raw films project has been one of the most difficult projects, but we have been lucky to secure the collaboration of the French firm of Messrs. Bauchet. There have been some misgivings in the minds of the film producers and users, but I can assure them that we are taking the greatest care about quality; only about 50 to 60 per cent of the national requirements of photographic films, cinefilms and X-ray films will be covered by this project, and if there is any shortage of higher quality goods, we may have to import some of the raw films for some time.

Here also, I would invite the co-operation of those internationally famous raw film manufacturers who had so far kept themselves a little shy of India, and say that they are most welcome to come to this country and produce, in collaboration with us in the public sector, the best of the raw films that they claim to produce in other parts of the world. Over and above their coming to collaborate with us, if they still want to have a unit of their own, we have no objection.

Watch Manufacture

Regarding the watch factory, there have been some doubts, but, on the whole, it has been well received. There have also been some doubts expressed as to why Government should go in the public sector on an item like watch manufacture. A watch, though it looks so small, is yet one of the most complicated and most precise machines and instruments. Therefore, it was found necessary to train

youngmen from this country who could be thoroughly wellversed in course of time as a result of training in the public sector's watch industry, and who may be able to or be enabled to start their own industries and spread them in the far corners of this country. It was very necessary to plan with confidence in this matter and, therefore, a public sector project was selected. Therefore, we are now establishing a watch factory in the public sector at Bangalore in collaboration with a Japanese watch company.

Sulphur from Pyrites

As regards sulphur, I can only say that we have been extremely lucky to have struck iron pyrites of rich variety in Amjor. Now we hope to raise the production from 100 tons per day to 400 tons of sulphur per day. This was a commodity which was all the time behaving like a mirage, always escaping till we reached some source. This is the first time that in Amjor we have been having a lucky strike where about 10 million tons of high grade iron pyrites have been located. The expectations are 9 to 10 times more than that, which will make the country, in a major way, more or less self-sufficient or at least less dependent on imports from abroad.

Newsprint

Regarding the NEPA Mills, we are not at all satisfied with the progress of NEPA. We have to improve the quality, we have to reduce the price and we have got to increase the production. Therefore, in the Third Plan period, we are going to double the production of NEPA from 100 tons per day, that is, 30,000 tons per year, to 200 tons per day, namely, 60,000 tons per year.

Textiles

Regarding textiles, I am not going into details. All I can say is that more and more production is the answer to the question of present price of textiles. We have assured the cotton mills as much cotton as they want through indigenous as well as imported sources and it will be in the fitness of things that the private sector, as they have risen in the past, would rise to the occasion to produce more and more textiles. That alone would bring down the prices in the ultimate analysis. They have done very well last year and in future we expect them to do better.

We have approved 4 types of automatic looms, the Sakamoto, the Toyodo, the Ruti and the Kovo looms which will be manufactured in the country and which will help to solve one of the basic problems of this industry, namely modernisation. Once these automatic looms are made—Ruti and Sakamoto are some of the best—they will help us to produce better cloth for export as well as for internal consumption.

Automobile Industry

Regarding the automobile industry it has been one of the Cinderalla industries of this country. Criticism has been pouring from various quarters. All I can say is that I have always felt that for an under-developed country like ours, the private automobile units have done really good work for this country. They have produced vehicles and trucks of various types, the trail leaders and smaller trucks and others, which for an underdeveloped country is not easy to produce.

Having done so, I should caution them about what the Jha Committee has suggested. They should immediately undertake—as they have already started doing it—to instal plant and machinery, so as to make all the vehicles produced, practically 85 to 90 per cent indigenous, within the shortest possible time. The necessary foreign exchange we have been granting them; and if more is required, we are prepared to grant. But we

will not allow them merely to halt and retard the growth of the indigenous content of this industry.

On ancillaries also, the Jha Committee has made very good and knowledgable observations. At one time it was believed that the ancillary growth is rather small. More or less, our industry is following a pattern of the continent, aiming at the production of a large proportion of the items through the ancillary industries and growth of ancillaries is going on an accelerated scale and we are going to give greater boosting to the ancillary industries in the Third Five-Year Plan.

As a matter of fact, in order to make the growth of ancillary industry possible, we are thinking of functional industrial estates in the Third Plan. That is there will be some estates which will be devoted to a complete variety of ancillaries required for a particular industry. If the automobile industry consists of 4000 parts or so, we shall try to parcel out in one sector in one single estate, practically all the components required for the automobile industry. Like that, half a dozen industrial estates can grow.

Similarly, for radio components. We will try to see that all the components that go into the radio, about 130 or 140 of them, are properly parcelled out and produced at one industrial estate. There would be many of them in different parts of the country so that intensive attention could be given to the scientific growth of ancillary industries which, in turn, would spread to the different parts of the country.

It will also be necessary to have the people's car, car of the people, manufactured by the people for the people of this country. There has more or less been insistent demand from the people. It has been passed that for the lower middle income group, we should have a car within the price range of Rs. 6,000 to Rs. 6,500. Just as we have Janata trains, we expect to produce Janata cars at the earliest possible times.

Once there is mass production of these cars, all the present difficulties will be minimised. It is the scarcity that has produced these conditions, that has upset our psychology for the last one or two years.

Industrial Machinery

Good progress has been made in the manufacture of industrial machinery. I may summarise the position. The sugar machinery has made the maximum progress. This year we are installing four complete sugar plants costing about Rs. 83 to 90 lakhs each with a capacity to crush 1000—1200 tons of sugar cane per day. The indigenous content of the plants is 80—85 percent and only 10—15 percent is foreign. We shall be able to deliver 8—9 such complete sugar plants in the next year and from 1962 onwards, every year 21 plants would be produced per year during the Third Plan which would give us 105 units in five years, of which about 60—65 will perhaps go to the new sugar factories and 40—45 for the replacement of the existing factories.

About cement machinery, we hope, with the three factories going up in 1962, we shall be able to deliver six complete cement plants per year from 1962 onwards, each with a capacity to manufacture 600 tons of cement per day. Therefore, to achieve the cement target of 13—15 million tons in the Third Plan, we may not have to depend upon imported machinery.

Similar progress has been made in the paper machinery. Certain attempts have been made and some plants will be delivered, but the progress is not as good as in the sugar or cement machinery. But within the next two years, we may be able to have five 50-ton paper plants per year for the establishment of paper factories. I would urge the need for the small-scale paper units. It is

our hope, now that we have licensed three manufacturers who will deliver to us 20 plants per year of 10 tons, 5 tons and below, at a cost of about Rs. 10 lakhs to Rs. 15 lakhs, we may be able to establish in the remote corners of the country, about 200 to 250 small scale plants in the coming five years and thus disperse the paper industry.

On the textile machinery front, we expect the requirements to be of the order of Rs. 30 crores per year. We have now formed certain groups which are in the stage of completion. The present production of textile machinery is about Rs. 9 crores to Rs. 10 crores per year. They will be able to deliver to the country after two years about Rs. 20 crores worth textile machinery per year.

Small-Scale Industry

About small-scale industries, the allocation for the Third Plan has been to the extent of Rs. 250 crores to Rs. 300 crores. But we do hope that the vitality and the crying need of these industries from every corner of the country will make us revise our thinking on this more and more and we will have a larger investment in the Third Five Year Plan. We have assured from the Small Industries Board that every State in this country will have one prototype centre, either of radio components or of canned fruits and vegetables or of electrical instruments or of mechanical and other instruments or like the foundry and light engineering in Howrah or machine tools in the West German Project in Okhla. Within the Third Five Year Plan period, we are endeavouring to provide every State in the country with one major prototype centre for small scale industries.

Curbs on Consumption

For a country of such low consumption as India and with such a vast populatien with an absolutely low income of Rs. 290 to Rs. 300 per year, when we think in realistic or practical terms, curbs on consumption at the moment are not very realistic or practicable. We will have, therefore, to produce more and more consumer goods to catch up with the rate of growth in national income. The private industry in the large-scale, medium-scale and small-scale sectors and all public industries should produce more and more consumer goods so that the demands could be stimulated, the national income can be re-absorbed through larger volume of wage goods which in turn will work as an anti-inflationary measure for a fast developing economy. Therefore, in that particular matter, the small scale industries have to play a major role.

In this connection, industrial estates are our principal instruments of propaganda. For these estates, Rs. 27 crores have been tentatively allotted which may be sufficient for 300 major industrial estates and about 200 rural industrial estates. In the Second Plan, we had only 20 rural industrial estates. We have not yet completed these 20 rural estates. But in the third Plan we believe that we shall establish 200 rural industrial estates in villages, having a population of less than 5,000. Besides these 200 rural industrial estates in the Third Plan, another 300 other industrial estates in cities, and in urban, semi-urban and other areas will be started, as against 100 industrial estates in the Second Plan.

For the next year, we have included ten to 20 industrial estates for the industrially backward areas. There are very many backward areas, of course There are industrially backward areas throughout the country. The industrially backward places must be looked after and must be given a higher priority than other areas. Ten to twenty industrial estates will be allocated in the coming year, 1960—6 for the industrially backward areas so that the programme could be started and then enlarged in the Third Plan to cover 300 major industrial estates and 200 rural industrial estates.

All our policies ultimately depend upon the foreign exchange resources and the manufactured articles. The future depends upon the exports and still more exports of manufactured articles over and above the traditional exports. As a friend of industry myself, I would like to make an earnest appeal that export is a must, and the take-off stage in the economy will only come, provided our exports are increased as we have done last year. More and more exports is the only way to industrialise this country, because export and industry go together. ★

For bigger successes, we must make biggest sacrifices.

BIG THIRD PLAN

The total investment in the Third Year Plan will amount to Rs. 9,950 crores according to a decision taken by the National Development Council, the supreme policy-making organ for planning in the country, at its fourteenth meeting held in New Delhi on March 19 and 20.

Of this investment, Rs. 5,950 crores will be in the public sector and Rs. 4,000 crores in the private sector. There will be, additionally, current surity of Rs. 1,050 crores in the public sector, which takes the total public sector outlay to Rs. 7,000 crores.

Of the resources, the States will have to find Rs. 1,150 crores and the centre Rs. 5,850 crores. But the States' share of the outlay will be Rs. 3,650 crores.

The National Development Council, which broadly endorsed the Planning Commission's memorandum which had submitted an outline of the investment pattern, financial resources, priorities and preconditions, was of the view that one of the most important requirements for the success of the Third Plan was that prices should not be allowed to rise.

The Chief Ministers of the States will gather again on April 17 specially to discuss measures relating to price policy.

Balanced Growth

The greater part of the second day's session was devoted to a review of the problems of balanced development in different parts of the country. The council felt that as large a proportion of the benefits of the Plan as pos-

sible should reach out to rural areas and to small towns. The need for development on a larger scale of power and of roads, and for a larger outlay on rehabilitation was also stressed.

As compared to the anticipated outlays in the Second Plan, the allocations for preliminary planning for the Third Plan are as follows:

In the private sector, the total investment for the Third Plan has been estimated at Rs. 4,000 crores, of which industry and minerals are expected to account for Rs. 8000 crores, transport communications and power for Rs. 250 crores, agriculture for Rs. 800 crores, village and small industries for Rs. 275 crores, urban and rural housing and construction for Rs. 1,075 crores and inventories for Rs. 600 crores.

The Prime Minister stressed the fact that all the magnitudes which the Planning Commission had suggested were at this stage quite tentative and that some aspects were being further examined between the Planning Commission and a Committee of Union Ministers who would go into the various changes which had been mentioned during recent discussions. The proposals were essentially a basis on which further work could now be undertaken by the Central Ministries and State Governments.

Price Policy

On the first day, in its discussion on price policy, the Council came to the unanimous conclusion that Third Plan could be formulated only on the basis that the price line would be held. It was recognised that variations in prices, particularly food and agricultural prices, from year to year and fluctuations at shorter intervals not only affected the physical targets which could be realised but also led to reduction of resources available for the country.

A number of factors were emphasised in this connection, particularly the need for maintaining the prices of food and essential consumer goods at steady and reasonable levels, for ensuring a proper relationship between the prices of food crops and cash crops and for securing the supply of the farmers' requirements of industrial goods at fair prices.

Referring to agricultural production, the Union Food and Agriculture Minister, S. K. Patil, suggested that every deficit State should endeavour to become self-sufficient or nearly so and that all reasonable incentives should be given to the cultivator to produce more. With reference to the plea advanced by several Chief Ministers in favour of State trading in foodgrains, the Union Food and Agriculture Minister urged a pragmatic view on the management aspects of the problem of food distribution.

Financial Resources

The Council considered in detail the Planning Commission's estimates for resources in the Third Plan. The Working Group on Resources had proposed that for financing a total outlay of Rs. 7,000 crores in the public sector in the Third Plan, there should be a total additional taxation of about Rs. 1,650 crores of which about Rs. 1,150 crores might be raised by the Central Government and about Rs. 500 crores by the State Governments.

According to the proposals of the Working Group on Resources, out of the outlay of about Rs. 3,650 crores which was likely to fall within the plans of States, their total contribution was expected to amount to about Rs. 1,150 crores, including resources on revenue account, contribution of public enterprises and resources on capital account.

I.G.T. 9684

India's People and their Costumes

THE MARATHAS: Are a sturdy race from Western India, mainly engaged in agriculture. The men wear a simple dhoti and bright-coloured turbans.

The women wear checked 'cholis' or bodices with elbow-length sleeves usually of bright red or yellow on green or dark blue. Their bright-coloured saris have tape borders of red 'saw-tooth' design. They are very fond of heavy silver jewellery.

Textile manufacturing — India's largest industry — is the most vital element in the economic progress of the nation. The Tata group of textile mills which is one of the largest in India and employs over 23,000 workers, plays a material role in providing plain and fancy cloths to India's millions in improved qualities at low cost.

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After considering generally the scope for rural taxation, betterment levies and electricity duties, the Council agreed that more detailed discussions between the Planning Commission and individual States should now proceed on the basis of the recommendations made by the Working Group on Resources. In the course of discussion, reference was also made to the prize bond scheme. The Union Finance Minister, Shri Morarji Desai, indicated that half the proceeds of price bonds would be made available to the States.

Third Plan Aims

The Council was of the view that the main tasks to be undertaken during the Third Plan should be:

To secure during the Third Plan a rise in national income of at least 5 per cent per annum, the pattern of investment being designed also to sustain this rate of growth during subsequent plan periods;

to achieve self-sufficiency in foodgrains, and increase agricultural production to meet requirements of industry and exports;

to establish basic industries like steel, fuel and power and, in particular, machine-building capacity, so that the requirements of further industrialisation can be met within a period of ten years or so mainly from the country's own resources;

to ensure a substantial expansion in employment opportunities; and

to bring about a reduction of inequalities in income and wealth and a more even distribution of economic power.

Population Rise

The Council took note of the fact that according to the present tentative estimates of the likely increase in population, the annual rates of growth anticipated for the Third, Fourth and Fifth Plans were 2.14 per cent, 1.9 per cent and 1.47 per cent. While rise in living standards and developments associated with industrialisation would operate in the direction of reducing the birth rate, it was agreed that during the Third Plan, family planning programmes should receive a great deal of attention.

In its discussion of priorities for the Third Plan, the Council agreed that the first priority should given to agriculture. There had also to be necessarily considerable emphasis on the development of basic industries, specially steel, machine-building, fuel and power, on which the capacity of the economy to develop in future largely depended.

In the discussion on priorities, considerable emphasis was placed on technical education at all levels. Two suggestions were made: firstly, that extensive training facilities should be organised at all large industrial plants whether these were in the public sector and secondly, that every effort should be made to provide larger funds for the expansion of technical education.

Conditions

The Council emphasised the following as being the essential conditions for securing the successful implementation of a plan of large development:

(1) a rapid increase in agricultural production and fuller use of the country's manpower resources;

(2) public enterprises being carried out with economy and efficiency and yielding the maximum returns feasible:

(3) laying down and carrying out an integrated price policy;

(4) construction programmes and costs being kept to the minimum;

(5) high levels of administrative efficiency and determined efforts to raise standards in administration; and

(6) realising the maximum employment potential inherent in the plants of the public and the private sector.

Building Economics

A great deal of stress was laid on the need for securing the utmost economy in construction programme, specially through the adoption of austerity standards and the proper planning of supplies of materials such as steel. The importance of extending power to rural areas and developing small industries through industrial estates and other means was emphasised by the Minister of Commerce and Industry, the Chief Minister of Madhya Pradesh and others. The Council generally agreed that in the development of village and small industries the emphasis should shift more and more from subsidies to positive measures, so that all these industries became self supporting. It was recognised, however, that in this respect khadi was on a special footing, but even in regard to khadi, future development should be organised on the basis of subsidies becoming a gradually diminishing element.

Figures "tentative"

In his inaugural address, the Prime Minister emphasised the fact that the proposals contained in the Planning Commission's draft memorandum were very tentative. What was finally determined was not the draft Plan, he said, but the conditions that had to be faced in implementing our Plans. Some of these conditions were of our own making.

Planning, the Prime Minister said, was a continuous process and successive Five Year Plans were closely interrelated. The pers-

pective of future planning was embodied in the Second Plan and we would have to keep in mind the fourth and even the fifth Plans in finalising the Third Plan. With the experience and the data gained in planning we were in a better position now to consider the various factors relevant to planning. The most important factor and the most difficult to evaluate, he said, was the factor of work, how much hard work we could put in.

Referring to arguments sometimes raised against the whole conception of planning itself, the Prime Minister said that planning was neither a listing of items nor a political ideology. It was an intelligent, logical and scientific approach for laying down certain objectives and indicating the way to achieve them.

Science was not governed by and ideology. The was no such thing as capitalist physics or communist chemistry. Raising standards of living today depended upon more production and better distribution. A solid foundation for a self-reliant and self-generating economy could not be laid without the fullest use of the modern techniques which science had placed at our disposal. Denial of planning, the Prime Minister empasised, in a sense, implied the denial of technology.

The Prime minister said that during the last few years India had made creditable, even remarkable progress in almost all directions. This did not mean that there had been no failures and no imbalances. These were a consequence of trying to do over a short period the work which would otherwise take much longer.

The Prime Minister emphasised that there was no conflict between agriculture and industry. Both were closely interrelated. There could be no industrial growth without agricultural progress. Similarly, industrial progress was required to meet the needs of agriculture and also to give that impetus required for getting out of the rut and creating the necessary conditions for good husbandry.

The Prime Minister reviewed the progress made in the basic industries like steel and machine building. If we did not expand in both the fields we would always have to rely on the outside world and also incur heavy expenditure in foreign exchange. Planning in basic industries also involved long-term planning because steel plants took a long time to build. The expansion of the basic industries stimulated greater demand for raw materials like coal. Shortage in these was itself an indication that we were advancing and required more raw material for that advance.

The two sectors

Referring to the roles of the private and public sectors, the Prime Minister pointed out that our policy here was guided by the clear indications given in our Constitution, against the concentration of economic power in a few hands. He said that our approach in this field was pragmatic, the aim being to increase production. The Industrial Policy Resolution represented a broad approach and a flexible policy indicating directions along which it was advantageous for the country now and in the future to develop.

The Prime Minister concluded his address by emphasising the human factor in progress. Though we could introduce new techniques, utimately the progress of our rural areas depended upon the peasant. Whatever could enthuse him to greater efforts should be the most important consideration. It was for this objective that the Community Development movement was started several years ago and the co-operative movement was sought to be strengthened. Recently, institutional changes like the revival of the Panchayat system and the establishment of Panchayat Samitis had been introduced.

The Prime Minister concluded by stressing that the lesson that we learned in the days of our struggle for freedom, the lesson of self-reliance, had to be remembered afresh in the light of the changed circumstances. ★

In this age of dynamic developments, electronic computers play a vital part. Here is a brilliant survey.

ELECTRONIC COMPUTERS

STEPHAN SCHATTMAN

The first computer built by a British manufacturer was installed at the University of Manchester at the end of July 1951. Eight years later, an estimate puts the number of computer installations so for delivered by nine manufacturing companies in the Uuited Kingdom at well over 200, while a further 125 are on order. A considerable number of these computers have been exported or are due to be shipped to 17 oversea countries, including the United States.

The biggest problem facing the layman who is trying to appreciate the significance of electronic computers is the wealth of new technical jargon to which they have given rise and the highly colourful, but quite inappropriate, names which they have received. To talk of electronic brains, for instance, is wholly misleading. Electronic robots or morons would be much more appropriate, for these machines differ from real brains in almost every respect. And that is exactly why we need them.

A digital computer adds and subtracts numbers and decides which of the two is the larger. The abacus, whose history goes back two-and-a-half thousand years, uses beads on wire for this purpose The modern electronic computer uses electrical impulses. In can perform any kind of calculation which can be broken down into elementary arithmetical operations. But in arriving at a correct solution, the computer acts rather unintelligently. It tries out every possibility until it hits on the correct move. An intelligent human, on the other hand, from the outset rejects certain moves and accepts others according to some concept in his mind.

Greatest Virtue

Perhaps the greatest virtue of electronic computers is that they are automatic. But obviously, as the machine cannot think for itself, it must be provided with the instructions (commonly known as the "programme") for all the calculations to be undertaken in the correct order. And it must be fed with all the numerical data it needs for a complete calculation. All data and instructions are deposited, as it were, in the machine's "memory" with the help of electric impulses.

The "programming" of computers has become a new profession, requiring skill and experience which can be acquired only gradually. In a way, this is typical of electronic computer technique in general. In contrast to past economic development, machines have become available before we really know how to handle them and how to use them most effectively.

Roughly, until the middle of 1956 the majority of computers in operation in Britain were used by the universities and Government research establishments. But since then industry and commerce have rapidly come to the fore as users. And now the number of machines sold for business purposes exceeds those acquired for scientific work. These are just a few examples of the use of computers:

A world-famous British company uses a computer for work on aero-engines, and rocket and nuclear energy power plant design. Some local authorities have installed computers to prepare rate demand notes and to keep rate payers, and other accounts. One of the leading British banks has ordered a computer to keep the accounts of a number of its branches in London's west End. Pay-roll and stock control are, of course, frequent applications. In electric power generation and transmission, computers have found new uses both in the lay-out of grids and in finding the best way in wich turbines and generators can be associated with nuclear reactors.

Reduction In Costs

Through the computer control of machine tools, developed by two British manufactures, machining operations can be initiated merely by writing out instructions and specifying dimensions which lead to a reduction in overall production time by four-fifths and more. At the same time, tatal costs are less than those of conventional methods.

However rapid the progress of recent years, we are only at the threshold of the era of electronic data processing—the generic term used for the application of computers in industry and commerce. Future prospects are exciting, indeed.

In industry, to give but one example, computers will be coupled with data reduction systems by which readings of measuring instruments are taken at pre-determined levels and the resultant information presented at central control points in tabulated form. Conditions and trends can then be compared with the computed optimum, the necessary calculations rapidly made and the answers signalled to the appropriate points in the process. In this way, plants can be operated at maximum efficiency.

As for clerical applications, much development work is in progress, aiming at feeding information into the computers by scanning original documents and from locations distant from the installation itself.

Direct and Indirect Gains

Bearing in mind the not inconsiderable capital outlay, the question whether it will all pay is fully justified. The answer can be given in two ways. First, there will be direct savings. One British firm, after a careful study over several years, found that the computer finally chosen would pay for itself in five years, at the most, at the present level of output. Of course, such economies may not be achieved in all cases.

But there are also indirect benefits which provide the second part of the answer. The most important aspect of the work of a computer is that of providing management and research workers with information which otherwise would not be available at all, or only with a great deal of delay. The computer will take care of routine decisions while enabling management to concentrate on more complex problems for which it supplies the requisite data. It will, in fact, select and isolate facts that reguire attention. This means that policy-making can be based on current and not, as is usual, on retrospective information.

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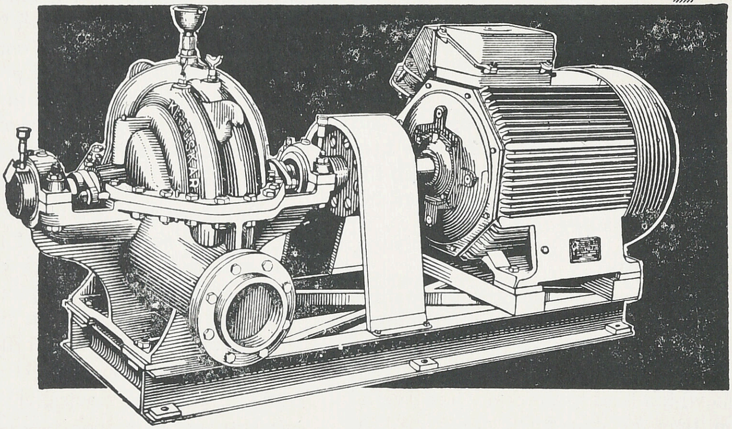

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ICF is not one factory. It is many factories integrated into one.

PERAMBUR'S 1,000TH COACH

S. R. TIKEKAR

When you board a train, do you ever give a thought as to how it came to serve you? How was it designed, who made it, where, and how safety has been assured for you in your temporary house on wheels?

A visit to the Integral Coach Factory at Perambur, will answer these and many other of your questions.

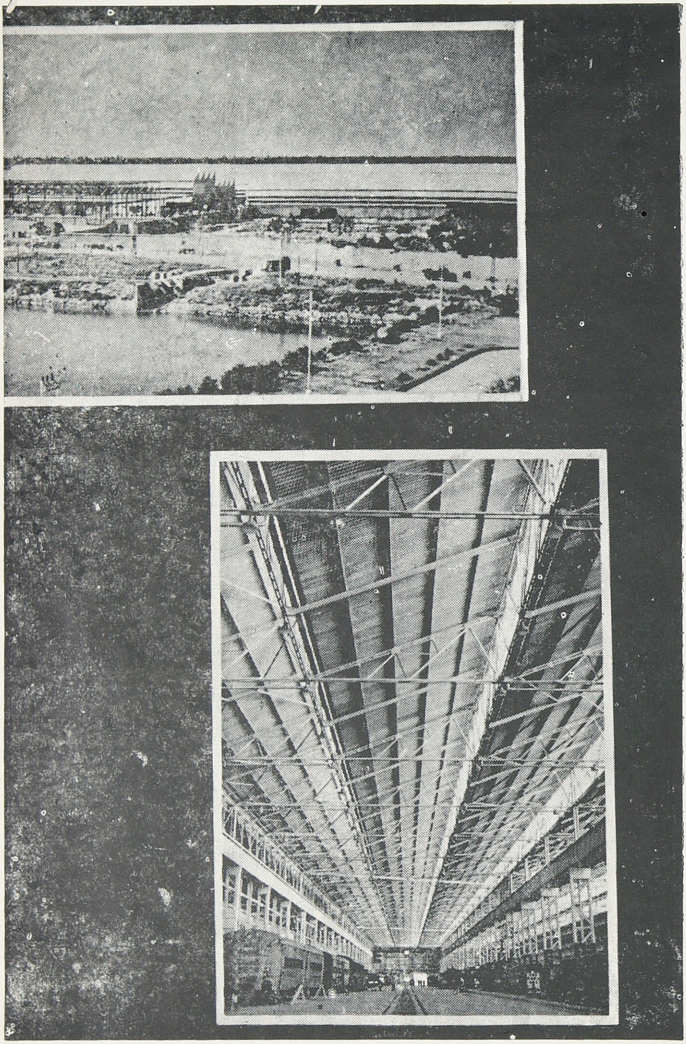
The Perambur Coach Factory, situated in a suburb of Madras, was started in 1952 in collaboration with a Swiss Manufacturing Company. This State undertaking, run by the Railway Board and employing nearly 5,000 workers, was set up with an initial outlay of Rs. 7.35 crores. Its production so far of coaches is valued at more than Rs. 10 crores and it has thereby, saved a good deal of foreign exchange.

The Factory

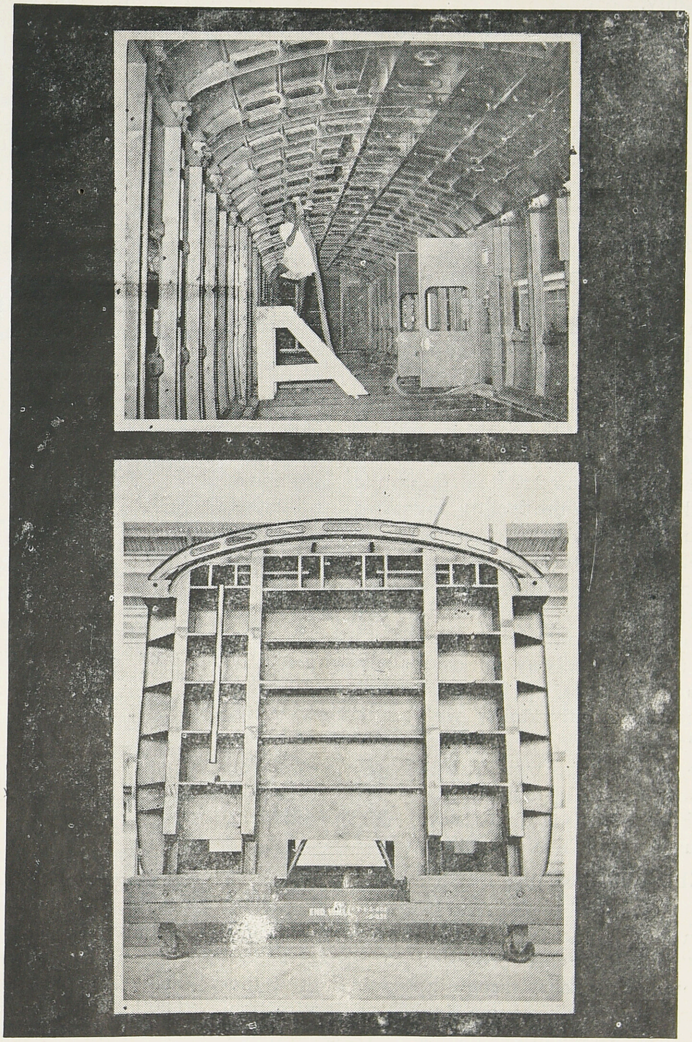
The first coach came out of the Integral Coach Factory in 1955, and the 1000th in the beginning of 1960, months ahead of the anticipated date. With 1100 and odd machines and over 30 cranes, the factory is spread over 10 different shops, closely knit together by road and rail systems. Within the shops, roads extend to $3\frac{1}{2}$ miles while the railway lines are nearly 12 miles long. The entire area under roof is $8\frac{1}{2}$ lakh sq. ft., and the biggest shop is 1000 ft. long and 260 feet wide.

The welded trough

The Perambur coaches are of the integral type. The integral type gives added safety and strength of the body, with an overall reduction in weight. These coaches are antitelescopic i.e, they will not yield to pressure on buffers; also, on sides, they are tested to stand heavy impact. The idea is to have a shell of a compact, strong material with a fullbed of 70 ft. length. The inside floor of the coach for the entire length of 70 ft. is a welded trough, which



The Integral Coach Factory at Perambur, Madras, is creating history. Railway Coaches with all amenities are built here.



To make travel a pleasure, we need modern coaches. Coach-building has attained perfection in ICF.

forms part and parcel of the body of the coach, thus doubly assuring the anti-telescoping quality.

A third class coach with 80 seats, 70 ft. in length, weighing nearly 35 tons, has in its bare form (without furnishings) about 1,200 different parts. Out of these only three, the wheels, the axle and the roller-bearings are yet imported. With the commissioning of the Axle-Wheel Plant in Durgapur next year, only bearings will have to be imported.

Training

In picking up the know-how and in handling the many complicated machines, our young engineers and technicians have shown wonderful capacity. The ICF is now run more or less by our own people.

How do these young engineers and skilled operatives get the requisite training? Of course there is a regular institute attached to the ICF where at a time 250 fresh apprentices are housed and given the facility to master the technique of running the machines. There are also refresher courses for those already in service. One of the special branches of training is the welding school where welders of a variety are trained, not only for the needs of the ICF, but also for the railway workshops elsewhere. By its very nature, the ICF is eminently suited for specialising in training welders as much of its assembly work is of welding: spot welding, seam welding, welding with gases (oxyacetylene) or with electricity. A regular supply of technicians is thus assured—for the efficient running of ICF as also for its expansion.

Cheaper and quicker

Originally, when the ICF was inaugurated on the 2nd of October 1955 by the Prime Minister, it was proposed to produce 350 coaches a year. From that date began the amazing performance in which production always exceeded estimates. During the first year, it was planned to produce only 20 shells (as the unfurnished coach is called). When the targets were revised, the figure was doubled. Actually the ICF produced 43 shells! Similarly, during the second year of its working the actual achievement was 150 against 100 and 120 of planned and revised targets respectively. Year after year the performance has improved. Each year the record of the previous year was broken. And finally even the 1000th coach was out of the ICF far ahead of schedule.

This striking success is doubtless due to the quick grasp and mastery of technique by our young technicians who run the ICF. In the initial stages, a coach took 19,000 man-hours to be made and the output was based on this figure making due allowance for the improvement and skill acquired in the process. Today the same work is achieved in less than half the time, 8,500 man-hours. This considerable saving of manpower and time has resulted in the reduction of the cost too. The landed cost of an imported shell was Rs. 186,000 while that of the one made in ICF works out to Rs. 85,000 only.

Future Plans

This however is only the beginning of the ICF. It has to have its own furnishing unit as the cost of the that operation is nearly as high as that of making the shell. Originally, furnishing a coach was a function involving nearly 13,000 man-hours and costing about Rs. 1,00,000. Today the time has been reduced to about 6,000 man-hours and the cost, in consequence, to Rs. 60,000. With greater efficiency and skill, the time and costs can be still further reduced. But a special furnishing unit will require about Rs. 4 crores of initial investment to be able to furnish about 350 coaches per year or about 30 coaches per month.

As the ICF wants to increase its production capacity to 700 coaches per year, the furnishing unit is a must and the Railway Board has wisely made a start in that direction.

The ICF, therefore, is not one factory but many factories integrated into one. Like Chittaranjan, where locomoives are manufactured, Perambur will always be remembered whenever we take or leave a train. Whenever we see a train passing by, we should feel proud of those technicians who made a Swadeshi Coach possible shortly after we became a free country.

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This is the Aluminium Age. The part played by AL-IND is brilliantly portrayed here.

ALUMINIUM

"Electricity is the key to all prosperity and for the transmission and distribution of the electricity generated to the steel plant at Rourkela, the cement factory at Rajgangpur, the ferro-manganese plant at Jodah and the paper mill at Brirajnagar, we require conductors. Ours is a country which does not have much of copper, and for the hundreds of thousands of miles of lines, we require aluminium conductors", said Dr. Harekrishna Mehtab, the Chief Minister of Orissa, inaugurating Aluminium India's second aluminium conductor manufacturing plant at Hirakud.

The new plant consists of a rod mill, a wire mill and ancillary equipment.

The rod mill, which has a capacity of 4000/6000 tons per annum, uses the continuous casting and rolling process as developed by brilliant inventor Ilario Properzi. The second of its kind to be installed in the orient, (first one, also, is with Alind at Kundara) this mill casts at the rate of two tons per hour. Comprising this installation are (i) a furnace unit (two low-frequency induction types and two resistance-heated holding and casting furnaces), (ii) the casting machine and (iii) the rolling stand.

The wire mill consists of tandem wire drawing equipment and a battery of high speed, tubular stranding machines capable of drawing up to 37 strand conductors

The significance of this plant can be gauged from the following observators of Mr. Frank Nicholls, President, Nichols Wire and Aluminium Company, Davenport, Iowa. Tremendous technological revolution taking place in the world, particularly the break-through in the usage of aluminium for more and more Engineering applications and underlined the significance of the contribution of the properzi Continuous Casting and Rolling process to world economy.

This is the Aluminium Age. The volumetric increase in world output of aluminium far exceeds that of other metals—even steel. In these inflationary days, aluminium with its scable price is in the best buy category.

This is the Jet Age in communications. The Jet age has already come to India. In the U.S Railways are becoming more and more obsolute and out of date. It is certainly possible to forecast today large-scale transportation of good even iron ore and other bulk materials at economic rates in Jet Transport planes. To this extent the St. Lawrence Seaway appears to be uneconomical and superfluous.

Various technical developments in the continuous casting field. Painting ingots with carbon black before charging into furnances for example saves nearly 25% of the energy for melting. Mr. Properzi has already perfected and put on the market machines for continuously casting and rolling copper into 1/4'' rods.

The aluminium business in the U.S. is today most active and prosperous. Some of the Aluminium smelters are using in some cases electric power produced from low quality coal at the pit mouths. Aluminium inltiplex cables in distribution accounts for 90% of all present-day installations. Messrs. General Cables Corporation have perfected continuous sheathing of cables and with aluminium. Battery connections, automobile and air-craft cables, are other new electrical applications. Copper cable works like the U.S. Rubber Company and Home Cable Corporation, have been brought over by the aluminium interests like Kaisers and Alcoa. There are thousands of new applications being developed for aluminium wire-fencing-nails. The latest is Xmas tree wire which alone accounted for a sale of over 1.5 million pounds last year by Nicholls Wire.

The world is fast becoming more and more prosperous. Indeed the whole world looks differently today from 1950. There is tremendous building activity all over the world. In India this is even increasingly so.

Mr. Nicholls complimented AL-IND for their leadership and pioneering work in the aluminium conductor business and in the development of the continuous casting and rolling technique. AL-IND run two Properzi machines in India the only others who operate more than one machine elsewhere are General Cable Corporation in the U.S.A. and BICC in the U.K. There are at present all over the world, nearly 40 units working on aluminium and 10 on zinc.

Mr. Nicholls concluded his address by referring to the major contributions made to the metallurgy by the great pioneer, Mr. Ilario Properzi, the inventor of the Continuous Casting and Rolling process. The Properzi process has enabled smaller companies to great production of semi-finished materials for their own consumption and thus allow semi-integration in production lines with a minimum of capacity.

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In Jwalamukhi a gas fountain with a yield of 50,000 cubic metres per 24 hours was obtained from a depth of 890 metres.

SOVIET OIL WORKERS HELP INDIA

N. KALININ, M. Sc. (Geology)

Head, Oil and Gas Dept., USSR Ministry of Geological Survey and Conservation of Mineral Resources

About four years ago (in 1956), when Soviet oil experts submitted to the Indian government, at its request, a draft five-year plan of prospecting for oil and gas deposits in India, Mr. Deshmukh, former Finance Minister, said: "You recommend spending 300 million rupees to carry out your plan and to discover at the cost of these expenses one or two deposits of oil or gas, but won't this be a waste of money? You probably realize that India isn't rich enough to be able to afford an insufficiently grounded risk."

That was a just question. Deposits of oil and gas are hidden in the earth at great depths and not always are they discovered with the very first wells. Nevertheless we answered: "Oil and gas are found by those who look for them, and the first condition for finding them quicker is an ardent desire to do it." Then we proceeded to prove that the expenses for organizing the search and prospecting for oil and gas deposits were reasonable. "Let's see what the money is to be spent on", we said. "First of all it is to be spent on the drawing up of geological and geophysical maps which no modern state can do without, if it is interested in developing its mineral resources. Is this a waste of money? No, it is not! Secondly, the work to be done will involve the training of Indian personnel—geologists, geophysicists, welldrilling engineers, oil-field operators, and many other specialists. Is this a waste of money? No, again it is not. Thirdly, repair shops, residential settlements, laboratories will be set up in India, equipment will be purchased that will always find an adequate field of application. And this can't be considered to be wasted money either! The expenses involved in drilling

deep wells may turn out in the end to be of little use, but if we do succeed in discovering but a single 30-million-ton oil deposit, all the expenses will be more than fully justified."

There were quite a number of such talks. The result was that Mr. Malaviya, Minister for Natural Resources and Fuel, said: "We thank you, indeed. You have not only done a big job, but you have also given us the certitude that we shall be able, by our own efforts and with a little help, to create within a short time our own national oil and gas industry."

Three years are not a long period of time. Sixty million rupees have been spent on oil prospecting, and there are already 15 Indian geological prospecting, 7 seismic prospecting and 9 gravimagnetic parties, several drilling teams, research laboratories, repair shops, and other establishments functioning quite successfully. By geological and geophysical methods more than 15 promising areas have been prepared for prospecting, a gas deposit has been discovered in Jwalamukhi and an oil deposit in Cambay. In Jwalamukhi a gas fountain with a yield of 50,000 cubic metres per 24 hours was obtained from a depth of 890 metres. In Cambay oil with a yield of 50 cubic metres per 24 hours gushed out from a depth of 1515 metres, the well diameter being 5 millimetres. With such yields the mining of gas and oil is quite profitable already. And although the resources of oil and gas have not been fully determined yet, there are sufficient grounds already to consider them quite sufficient for development on an industrial scale.

Thus the co-operation of Indian and Soviet specialists has proved to be quite fruitful. Of course there still is a long way to go from the discovery of oil and gas deposits to their commercial exploitation. But the main thing has been achieved already, all doubts as to the possibility of creating a national oil and gas industry have been removed, and it is probably not without ground that Mr. Malaviya stated that while the second Indian Five-Year Plan was devoted mainly to metallurgy, the third Five-Year Plan should be devoted to oil.

A conference of the "Commission on Oil and Natural Gas" was convened in August-September, 1959, in Dehra Dun and then in Delhi. Soviet oil specialists took part in its work. The conference appraised at their true value the doubtless successes and prospects of work and mapped out a long-term plan for the prospecting and development of oil and gas deposits for 1959—1966. It also worked out a wide range of organizational, technical and economic measures designed to overcome the existing difficulties. It was decided to concentrate attention on the Cambay valley, Assam and Punjab and to continue prospecting in the Ganges valley and some other areas.

Considerable attention was paid to the training of specialists and skilled oil workers, as well as to exploring the possibility of manufacturing oil equipment and materials within the country (first and foremost, of spare and individual parts for drilling machines, derricks, storage facilities, tamping cement, and many other items.)

It is envisaged that in the course of 5 to 7 years a basis for the planned development of the Indian national oil industry will be created and that it will be possible to start getting oil in 1962, and to meet a considerable share of the country's demand in 1966.

There is no doubt that India is sufficiently rich in oil and gas, otherwise they would not have been discovered after drilling the very first prospecting wells. Now it is a matter of organizing the drilling, oil-getting, geological and geophysical work and the relevant auxiliary operations on a scale corresponding to the long-term plan.

Favourable conditions exist now for the successful fulfilment of this plan, and I should like to wish my Indian and Soviet colleagues, who are engaged in carrying it out, the greatest of success.

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The textile industry is the biggest in India and here is a masterly survey by an expert.

INDIAN TEXTILE INDUSTRY

K. PARTHASARATHY

As the Greek philosopher said "It is not walls that make a city, but its men. It is not physical geography that moulds a nation but its intellectual community". What is true of politics is equally true of an industry also. This is an age of industry. It is not merely the availability of raw materials in a country, that help a nation or people build an industry but the industrial metamorphosis i.e., conversion of the raw materials into finished products by a proper and balanced application of the latest machinery, highest technical skill, to achieve the maximum social advantage qualitatively and quantitatively, at the same time building a healthy foreign market. Textile Industry is no exception. On the other hand, it needs specialised latest equipment, well trained technical and official personnel and above all discriminative financing to keep pace with the fast growing demands of the public for quality textiles at economical prices. From time immemorial Indians were great lovers of good dress as the Egyptians were as the historical records confirm of the picturesque orient splendour. The taste for good dress, the skill for perfection in production is inherent in them. It is a question of conducive circumstances stirring their genius to produce the best, most economically.

The study of the evolution of the Indian Textile Industry as are of the important major industries of India is romantic and deeply interesting as it throws a great light on the potentialities and possibilities in the field. Cotton growing in India dates as far back as 5000 B.C. The Mahenjodara and Harappa civilizations lend evidence of profuse cotton growing and cotton weaving industry. The Indus valley civilisation encouraged cotton spinning to such an extent, that in the ancient

world it became proverbial that "while China was noted for its silk, Egypt for its flax, India was renowned for its cotton and cotton textiles". As the wheels of time, moved on, they have left on the track many an honoured award for Indian Textiles both at home and abroad.

In the context of the study of the Indian textile industry, it is also relevant to know the basic factors about 'Indian cotton growing' which constitutes the foundation and framework of the Indian Textile Industry. In other words it is the "crux of the problem". Of the many agricultural products in India, cotton growing has been one of the ancient traditions of the cultivators. India enjoyed and still enjoys certain geological advantages for the cultivation of the cotton crop. Records are in evidence to point out cotton export to foreign countries like Italy and Egypt between 569 and 525 B.C. Down the centuries, India maintained in the face of many famines and natural catastrophies, its rich tradition for cotton growing. In mediaeval India, particularly during the Moghal regime, the cultivation of cotton crop was much encouraged and formed an important source of revenue to the Government.

The beginnings of the modern times gave a turn in the cultivation of the Indian cotton crop. Politics played the part of vested interests. East India Company encouraged with great zeal cotton plantations in India with the manifest motive of exporting the raw cotton, only to dump it back on India, in the form of finished goods, thus realising huge profits from the Indian import of cotton textiles from England. The coin was tossed in favour of England, Britain imported 4 million Lbs of cotton in 1764. 56 million lbs of cotton in 1801. By 1858 India's export of raw cotton reached £ 4.3 millions and import of cotton finished goods from England £ 5.6 millions, thus leaving a margin of profit of £ 1.3 million for the year. Till almost 1907 the balance tilted to the side of England. But there was a turning point more by the caprice of nature than by the campaign of man. The great plague and famine of 1898 caused an acute scarcity for cotton and many flourishing mills had to be closed down. The question of the export of cotton to England was out of context. On the other hand, the absolute problem of increasing and improving the cotton output in the home country became the sole concern of the existing authorities. In the wake these absolutely stimulating circumstances, the establishment of the agricultural departments took place, poignant as it were. With the establishment of the Agricultural departments in 1907, measures were taken to improve the cotton cultivation from short staple variety to longer ones. Besides most enterprising attempts were made to preserve at home the maximum raw cotton for Indian mills. Intensive and extensive cultivation of the cotton crop were carried out to raise its quality and quantity. The Indian Cotton Committee was appointed in 1917-18 and was deputed to go into the guestion of cotton policy and trade which submitted a report in 1921 suggesting various measures to improve the yield and higher counts of yarn. Higher counts of yarn could be produced only from long staple cotton and best efforts were spared to produce the long staple cotton as in Egypt, Sudan, Peru and Aden. This type of cotton is required for making fine and superfine yarns. The Indian Central Cotton Committee appointed in 1921 did a good spade work. In 1923 it was incorporated under the Indian Cotton Cess Act and was provided with separate funds to grow and market least cotton. Three decades of persistent work, improving the staple length of the Indian Cotton and enormously increased the acreage under cotton cultivation. The Indian Cotton Cess Act in 1948 enlarged the functions of growing, manufacturing and marketing of cotton. In cotton production it takes the fourth place, with U.S A., U.S.S.R. and China-respectively taking the first three positions. In the Indian Union, Bombay, Madhya Pradesh, Madras, Punjab, Andhra, Rajasthan, Mysore and Utter pradesh are the principal cotton states. Many varieties of cotton are grown to produce more ears of quality. Some of these are exported to various foreign

countries. The Bengal Deshi, Oomras, Dholleras, Assan commillas, Cocanadas, Kalyan Janila, Virpar, Vijay are some of the cotton varieties of export to foreign countries.

India in the world today, in respect of acreage occupies the first position. At present out of an acreage of 20.10 million acres 17.5% is under short staple, 42% under long staple and 40.5% under medium staple. Over 62 lakh bales of cotton, are expected to be produced by the end of the second five year plan. It is only fitting in the nature of things that today India stands as the world's second largest producer of cotton textiles second to U.S.A. which takes the first score. Scarcely five decades ago India was one of the world's largest importer of Textiles, the imports from the U.K., alone amounting to more than 25,600 million yards in 1913.

But to-day the position is altered. India now is one of the leading exporters of piece-goods, not only to countries in the Middle East and Near East, but also to the United Kingdom. There is a history, a tradition behind this achievement.

India made cotton cloth even before 3000 B.C. and exports to western countries was then in a flourishing state. Down the centuries it preserved and improved the art of weaving to such perfection, that during the Moghul period the finest and world famous muslins and Calicoes were produced by deft hands. The Decca Muslin was the pride of Indian weaving craft. It was a dream come true, in the finest texture, baffling all description, so light, so airy like the feather of a swan. But with the advent of the British rule,—the reactionary forces of the Industrial revolution in England, were brought to bear upon the cotton textile industry in India. The invention of the large scale use of the cotton machinery, changed the face of England, which in its turn quickly replaced the dexterous skill of the deft hands by machinery forces. The textile industry before the advent of the factory system was almost a spinning enterprise in India. With the introduction of the factory system, there was a turning of the tide, in the history of the textile industry, all over the world, India being no exception to it.

During the very first phases of the factory regime, the position of India, in the context of her cotton mill industry was most discouraging. Cotton plantations were encouraged from the days of the East India Company till the Swadeshi movement, only to export them to England, with a view of dumping back on India, finished goods at a good margin of profit. Lancashire was a nightmare to the Indian Cotton spinning industry. It usurped the place of the deft Indian hands or in other words, heriditarily gifted craftsmen.

Only in 1817, the first British owned mill was started in India, on the banks of the river Hoogly, near Calcutta and was named the Howrah Cotton Mills. This was followed by an Indian enterprise in Bombay in 1854.

Between 1859—1876, there was steady record of initial progress. During this period, 47 mills sprang up and many of them in the vicinity of Bombay and Calcutta. By 1884, no less than 63 mills with a capital outlay of Rs. 657.6 lakhs and 16,10,6000 spindles began functioning though during this period, they experienced a stepmotherly treatment from the government.

The end of the 19th century saw the coming up of 193 mills with a total spindleage of 49,45,783 and 40,124 looms and the capital employed rose to 1,419.5 lakhs. During the early stages of the Industry, its main object was to spin yarn for which there was alround market, both at home and abroad. In 1902, with 211 million lbs of yarn India was the second biggest exporter of yarn to China. Japan's competition and the advent of the first world war gave a significant decline, in the volume of yarn exports.

The period between 1904 and 1910 proved a turning point in the history of the textile Industry. The Swadeshi Movement proved a fillip: consequently 207 mills with a capital outlay of Rs. 1878.7 lakhs were working then.

The total spindleage was 57,80,124 and the number of looms rose to 74,759.

The growth of the Indian cotton textile industry during the last three decades, especially during the last decade, has been remarkable both in quality and quantity. And to-day it is the biggest industry in India employing over eight lakhs of workers. It occupies a second place, second only to the United States in the production of cloth. The industry accounts for about 35% of the total output of the country. Prior to Independence ie in 1947 India had 388 cotton mills with about 10 million spindles and 2 lakh looms. To-day there are 482 active in full swing mills with a total spindleage of 13.40 million However the total number of mills come to 511. The production of yarn and cloth in 1957 is 1,780 million lbs and 5,317 million yards respectively, the highest recorded figure for the industry. The All India first estimate of the 1958—59 cotton crop puts the acreage at 15.511 thousand acres.

The importance of the Indian cotton mill industry as an important major industry in the national economy can be further realized by the present data available.

The Indian cotton mill Industry has a paid-up capital of Rs. 115 crores, representing nearly 12% of the total paid up capital of the joint stock companies in the country.

In the context, it is extremely encouraging to observe how the Indian central cotton committee fought the repercussions of "the partition of India" by foresight and endurance. At the time of partition in Aug. 1947 the area and production of cotton in India amounted to 11.7 million acres and 21.7 lakh bales nearly 2/5 of the cotton crop was lost to India ie 45%. For 423 mills only 409 remained in India. The net result was, that India had to depend on supplies of foreign cotton to the extent of 41% After partition, India's exportable surplus of short staple cotton has also gone down very appreciably. It became imperative to embark on measures for increasing cotton production within the country itself. The Indian central cotton committee with the timely aid of the agricultural department successfully fought the situation.

By distribution of improved seeds, application of manure, extension of irrigation facilities, control of insects, pests etc, improved not only the quality of the cotton but recorded a good record of average yield per acre. Greater use of the fertiliser became more popular.

The annual output of the country's industrial output covered by the census of manufacturers is Rs. 1,200 crores of which, the value of cotton mill production alone amounts to Rs. 400 crores or 35%. The estimated total national production of India is Rs. 10,800 crores, of which Rs. 840 crores is represented by factory establishments the share of the cotton mill industry alone being Rs. 133 crores. Next to Tea and Jute, cotton yarn and textile goods are the highest earners of foreign exchange in the country. The Planning Commission expects to realize Rs. 375 crores worth of external resources from this Industry by the end of the second five year plan. The strength of Industrial labour in India is 27 lakhs of which more than 8 lakhs or nearly 30% belong to the cotton mill Industry. Apart from this, thousands work in aucillary products like dyes, chemicals and mill stores. Cotton mill industry is also the main stay for the fortunes of the textile machinery industry which also employs vast numbers. In fact, the cotton mill industry employs a much bigger labour force than any other single mechanised industry in the country.

The wage bill of the Industry in India is about Rs. 100 crores and in centres like Ahmedabad and Bombay which represent about half the number of textile mills in India, it is about Rs. 50 crores. The state and central governments revenue from the Industry by way various taxes is more than Rs. 132 crores and a major portion of this is by way of excise duty. Besides the taxes and levies, the Industry pays state and Municipal taxes as well. All these, amounting to over Rs. 100 crores per annum, have become feasible, owing to a steady inc-

rease in the installed capacity of the Industry and consequent rise in the output.

The mills are situated in many parts of the country but concentrated thickly in Ahmedabad and Bombay. Bombay produces mostly medium and fine varieties. Ahmedabad specialized not only in medium, but also in fine and superfine varieties, with all facilities for processing, such as dyeing, bleaching, mercerising and printing. On an estimate, Bombay state excluding Ahmedabad produces 1,30,000 bales. while Ahmedabad produces 60,000 bales; the remaining 1,10,000 bales of the total production of 3 lakhs of bales of cloth per month is contributed by other production centres like up M.P., Madras and West Bengal.

Today, the Indian Textile Industry is consuming over 50 lakh bales of cotton annually of which only 6 lakh bales are imported and exports 5.5 lakh bales. The Indian textile industry as it stands to-day can produce over 6,000 million yards.

With the achievement of Independence, India is implementing Five Year Plans to build a strong national economy. As a major industry cotton textile Industry has its own integral part in shaping the national economy of the country. Already it has achieved the target set by the 'First Five Year Plan' one year ahead of its schedule. The second Five Year Plan terminates in 1961 and the target for export is 1,000 million yards in the light of the capacity of the industry to produce over 6,000 million yards and more if necessary. The per capita is expected to reach 22 yards by the end of the second Five Years Plan.

The committee of the Indian cotton Mills Federation, the Planning Commission, the Textile enquiry committee (Joshi Committee) The adhoc committee on textile machinery manufacture are all concerting in mutual consultation and effort to raise the Indian textile Industry to the zenith to serve the home interests as well as foreign demands. Mill made textiles include rayon and art silk made of synthetic fibres, which have a promising future.

There is a shift in the consumer demand which necessitates reduction in cost and improvement in quality. This calls for "technological improvement in production". Any major improvement in quality or reduction in cost, could be achieved only by adequate modernisation of the industry as a whole". The machines, most of them, that are in existence to-day, were installed more than 40 years back and have outlived their usefulness. A stitch in time is not merely a proverb but a profound economic truth. A timely and prudent process of renovation, replacement and maintenance of the textile machinery is an indespensable asset to the industry. Advanced technological developments, have already taken place in the sphere of textile manufacture. Some vital parts of the textile machinery like spindles, ring frames, plain looms, carding engines, textile stores etc. are now manufactured in adequate quantities in the country itself. A good start has also been made in the manufacture of automatic looms, draw frames, fly-frames and some types of wet processing machinery. The adhoc committee for textile machinery manufacture has taken the initiative to improve the quality and durability of the machinery. The latest and best are sought for in the sphere of the textile machinery.

In the study of the Indian Cotton mill industry, the handloom and khadi industries should not be put to disadvantage. Vice-versa, they should not be detrimental to the cotton mill industry or to the mill made cotton textiles. Each has its own place and merits in the building of the Indian national economy. The Karve and Kanungo committees, the All India Handloom Board are all by careful study, planning and co-operative effort, making the handloom industry expand and flourish. During 1949—58, 1820 million yards of handloom were produced and to 1.5 million families were employed by it.

The determination of wages plays a vital role in the progress of any industry, more so in the Indian cotton textile industry, as it is one the important major industries of the country. The wage bill of the textile industry, at present is 100 crores, a conspicuous figure.

The welfare of the industrial labour is a prerogative for the progress of the industry. But in determining the wages, the principle of maintaining a sound finance by necessary safeguards against loss, reasonable profits to the proprietors or shareholders, must be followed with discretion and optimism. The All India Wage Board for the Indian cotton textile industry is earnestly attempting to establish progressive peaceful relationship between capital and labour. The industrial labour should also cooperate with their other partners in the industry.

The Indian cotton textile Industry has a great and good future. Capital, labour, government have separate yet integrated parts to play in the future progress of the cotton textile industry in India. It is a brotherhood against which no disruptive element can play.

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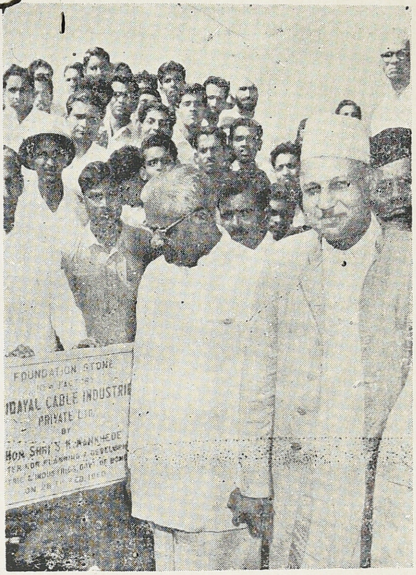
For the rapid industrialisation of India, Devidayals play a very significant part.



NEW CABLE FACTORY

S K. WANKHEDE

Minister for Planning & Development, Electric & Industries, Government of Bombay

We have all heard about the history of the family of Devidayals and it is in the fitness of things that from trade and commerce they are now coming into production. It seems to be the trend of almost all Industrial Houses in this country. After the advent of Independence the name of Devidayals has already become famous for different species of things for which they have entered into the market and this is very fortunate. This factory about which we have just now heard is coming up in these most scenic surroundings and the material aspect of life seems to be very well blessed with the spiritual aspect from the ones on my right here. The need of this industry is so terrific now that the one hunger, apart from the hunger of food, that is coming up in this country, is the hunger for electricity. With the impact of the villages and hamlets, even when we go to the most distant town or village, the question that is asked is not as to when that place is to have an approach road or school building, but the time when they are going to supply electricity to that place. It was calculated that at the end of the First Five Year Plan, right from the time that electricity was generated, only three million kW of electricity was produced or generated in this country. In the Second Five-Year Plan it was anticipated that the generation of electricity would be raised to 6.8 million kW, but because of the shortage of foreign exchange, it does not seem to be possible to reach that target, but it is certain that considering all the schemes that have been in existence, this country would be producing 6 million kW in this penultimate year of the Second Five-Year Plan. I have every hope that with the approach of the Third Five-Year Plan several industries will come up the benefits of which will be available in the near future for the people. It is from this point of view that it has almost been decided to step up the production of electricity to 12 million kW which may sometimes go upto even 14 million kW by

the coming in of atomic power. At least 12 million kW of electricity will be the possible target and it is from this point of view that the starting of such industries as this has become one of the greatest essential things and I am glad and happy to say that amongst other things this new venture is coming up in our State and nearabout the city of Bombay. I am particularly happy about the place that Devidayals have selected for the starting of this industry Ever since the last three years when I came across this portfolio in the Government, I have been thinking to disperse the industries. Life has become most miserable in the world of ours because of the unnatural growth and increase of population and the way the industries are growing in the island of Bombay and there is a misconception in the States that Bombay is a highly industrialized State. You will find that Bombay is a highly industrialized State in comparison to other States as almost 90% of the industries are scattered in three or four places. In the city of Bombay alone almost 70 to 85% are centered and amongst them 60% are centered within the four walls of the city of Bombay. This certainly cannot be allowed to go on and we have therefore decided upon the dispersal of industries and from that point of view and also from the point of view of the community having equal opportunities for employment etc that we decided to establish 16 industrial estates and I am glad to say that almost all of them with the exception of one or two are reaching a very advanced stage of completion. But, the thing about which I am most happy and about which we were in terrific opposition was about the reluctance of people from the industry to go out of the island of Bombay. We suggested to them to go over from Ghatkopar. There was a terrific opposition and almost for over a year we saw no construction activity upto Agra Road Nobody can come and whisper to me something because I come from Nagpur. I stuck to the decision and I am glad to see that many industries are coming up on both sides of the road. I am very happy that Devidayals have lately come over here and almost four other industries are coming up here. I am pretty certain that during the next four or five years the scenic nature of the place will change and instead of the trees chimneys will go up in their place It is a good thing that his idea of the dispersal of industries is beginning to take shape and I congratulate all those who have shifted.

As I have said, this industry is going to play a very important part in supplying thousands of miles of conductors and wires not only for the various schemes of government, but also for the firms engaged in the household industries. The prosperity of the country will also increase judged from the saving of foreign exchange or foreign trade. To do that some of these basic industries must grow. It is very heartening that in our own Western Region this industry is being set up. The emphasis was only on textile industries almost 10 years back and this has completely shifted to chemical and engineering industries. Devidayals have been acting as middlemen and then they have now begun production industries. The whole atmosphere has changed with the advent of Independence.

I am very happy to say that like many other leading Houses, Devidayals have also taken to the scientific method. I congratulate them for starting thus basic industry. I am sure that we have come all the way to wish them well. I wish them good luck and Godspeed and hope and pray that the starting of this and such other industries will lead us to the building up of a very strong, self-sufficient and healthy India. Thank you very much. ★

OUTLAYS IN THE PUBLIC SECTOR

Second and Third Plans

Head of development	Outlay in Second Plan	Allocations in Third Plan
	(Rs. crores)	(Rs. crores)
Agriculture & community development	530	1,000
Irrigation	400	650
Power	410	900
Village & small industries	180	250
Industry and minerals	820	1,300
Transport and communications	1,330	1,450
Social services and allied heads	880	1,250
Inventories	—	200
	4.550	7,000

MINERALS

The rising trend in mineral production which has been evident since 1955 continued during 1958 and the value of mineral output at Rs. 1373 million represented an increase of Rs. 80 million or about 6 per cent over the total value of production in the previous year according to the latest publication brought by the Indian Bureau of Mines. These figures, however, do not include petroleum and minerals falling under the Atomic Energy Act, 1948.

This increase was mainly reflected in the production of coal and non-metallic minerals. Coal, with an output of 46.07 million metric tons, was the leading commodity and was valued at Rs. 899 million. Next in order of value were manganese ore (Rs. 112.4 million), salt (Rs. 84.6 million), gold (Rs. 50 million, iron ore (Rs. 48.5 million), mica (Rs. 25.2 million) and ilmenite (Rs. 18.3 million). Mineral output in 1958 accounted for 1.2 per cent of the net national income of India.

Quantitatively the overall trend of mineral production during 1958 is reflected in the quantity of index of mineral production which stood at 125.8 in 1958 (base 1951—100) and shows an increase of just 2.1 points over the index for 1957 compared with an increase of 6.8 points in 1957 over 1956. The rate of increase in mineral output in India has fallen in 1958 mostly on account of the recent industrial recession which was of a worldwide character affecting the exports of the primary produce of many under-developed countries.

The output of coal in 1958 increased by 1.86 million tons as compared with 1957 The production of metallic minerals valued at Rs. 261 million accounted for nearly one-fifth of the total value of mineral production in 1958. Of this total value, ferrous group of minerals accounted for Rs. 164 million while minerals of the non-ferrous group accounted for Rs. 97 million. Amongst the metallic minerals the year was marked by record output of iron ore, copper ore, bauxite and lead concentrates.

The production of iron ore during the year reached the peak figure of 6.1 million tons and this was the result of significant improvement in the internal and external demand. The production of manganese ore, however, suffered a set-back and declined from 1.68 million metric tons in 1957 to 1.25 million metric tons in 1958.

The total value of non-metallic minerals produced was Rs. 132 million which is about 10 per cent of the total value of minerals produced during 1958. Compared with the previous year the value of non-metallic minerals was higher by Rs. 14 million and this increase was mainly due to higher production of salt and mica. The production of salt reached the peak figure of 4.2 million metric tons. Among the other non-metallic minerals the production of apatite, china clay, fire clay and magnesite during the year 1958 was the highest ever recorded. In the case of building materials the output of limestone reached a new peak of 10.5 million metric tons during the year. The higher production of limestone is consistent with the expansion in the cement industry. The value of building materials rose to Rs. 132 million in 1958 from Rs. 11- million in 1957.

The total value of metal production in India during 1958 was Rs. 1,115 million which represented a new peak. The ferrous group of metals was mainly responsible for the increase in the value of metal production. There was a tremendous increase in the output of ferro-manganese as a result of the ferro-manganese plant of TISCO at Joda and three other plants commencing production during the year. The production of finished steel, however, declined by 48,000 metric tons. Among the non-ferrous group of metals, aluminium and lead maintained the increasing trend of production while there was decline in the output of gold. The output of copper was maintained at the previous year's level.

State-wise analysis of mineral production indicates that Bihar State produced minerals valued at Rs. 488 million which was the highest amongst the States of the Indian Union. Next in succession were West Bengal and Madhya Pradesh. The higher value of mineral production in 1958 was mainly accounted for by Bihar, West Bengal, Bombay, Madhya Pradesh, Rajasthan and Uttar Pradesh.

Decline in Export Value: As an important source of foreign exchange earnings minerals occupy a prominent place in the economy of the country. The total foreign exchange earnings by the exports of ores and minerals during 1958 were Rs. 460 million which constitutes 8 per cent of the country's total foreign exchange earnings during the year. As compared to 1957 the value of export of minerals recorded a fall of nearly 28 per cent mainly due to lower exports of manganese ore for which the oversea demand had diminished considerably in view of the slackening of steel production in

U.S.A. and other industrial countries. As in the previous years manganese ore led the list of minerals exported, while iron ore, mica, coal and ilmenite followed in order of value. The principal markets for Indian ores were U.S.A., U.K., Japan, France and Czechoslovakia.

The total value of exports of metals during 1958 fell to Rs. 29.3 million in 1958 from 34.5 million in 1957. The iron and steel materials alone were responsible for a fall of nearly Rs. 9 million. The exports of almost all the non-ferrous metals fell during the year under review.

The total value of imports of ores and minerals fell from Rs. 94 million in 1957 to Rs. 80 million in 1958. Almost the entire fall in value of imports was accounted for by lower value of sulphur and phosphatic minerals. The totals value of imports of metals during 1958 was Rs. 1,328 million representing a fall of Rs. 583 million or 35 per cent compared to 1957. The ferrous metals, which accounted for nearly 66 per cent of the total value of metal imports during 1958, fell by about Rs. 496 million. The imports of iron and steel materials which is the major item, declined by Rs. 492 million and there was also a fall of Rs. 4 million in the import of pig and sponge iron. The imports of non-ferrous metals fell from Rs. 433 million in 1957 to Rs. 348 million in 1958. The fall was mainly due to the decline in the import of aluminium, brass and bronze and the lower value of copper and zinc imported.

The year 1958 was characterised by the falling prices of all grades of manganese ore. Mica splittings and mica loose varieties maintained the same level as in 1957. The price of ilmenite 55% T_1O_2 recorded a slight increase over the year 1957. The price of iron ore of 60% Fe decreased by Rs. 5 per ton during the second quarter after which it remained steady in the remaining part of the year. During the year under review the statutory prices of coal were revised in May 1958 and again in October, 1958. In May the Government of India raised the coal prices by Rs. 0.75 and in October 1958 reduced it by Rs 0.34. The striking feature of the metal marget during the year 1958 was the rise in the price of non-ferrous metals at a time when the international market was not very rigid. This was due to the shortage of supplies arising from delays in the distribution. In order to ensure supplies to the consumers and to regulate the prices, the Government of India promulgated the Non-Ferrous Metals Control Order in April 1958 and copper was the first metal to be brought under this Order. There was no change in the statutory price of pig iron and steel fixed by the Iron and Steel Controller with effect from July 16, 1957.

Under the impact of the industrial recession mineral output and consumption in many countries were lower in 1958. The effect of the recession was severe in U.S.A. where coal output fell by 18 per cent, iron ore by 36 per cent and copper by 9 per cent. There was, however, a distinct rise in mineral output in U.S.S R. and China. Coal output in these two countries increased by 66 per cent while steel output registered a 20 per cent increase

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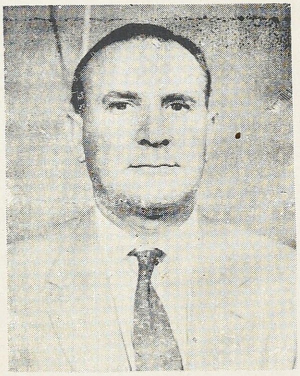

T. E. Read recently joined the Shalimar Paint, Colour & Varnish Co. Prv. Ltd., as Assistant Works Manager. He last worked in Cape Town, South Africa, as Technical Manager to Buffalo Paints Ltd. He has been in paint since 1932 when he joined Lewis Berger as a chemist. During the intervening years he has gained considerable experience in paint technology and works management and will be a valuable addition to Shalimar's technical staff.

He spent 10 years with Vulcan Products Ltd., Slough, Bucks., and also 3 years with their affiliated Company in South Africa, where he was responsible for the manufacture and also the marketing of paints and allied products throughout the whole of Central Africa. He has written a number of articles on Paint subjects and was a member of the technical committee of the paint section of the South African Bureau of Standards and for two years Chairman of the Cape Town Branch of the Oil and Colour Chemists Association.

Mr. Read is married and has two daughters who are with him in Calcutta. His hobbies are: Table Tennis, Golf, Swimming and Walking.

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